

Expedited Workflow for Emergent MRIs Overnight

Introduction/Problem

- Overnight workflows can be challenging due to limited staff and resources. Delays obtaining stat inpatient and ED MRIs overnight have been reported and resulted in staff frustration.
- Identifying workflow bottlenecks could illustrate opportunities for improvement and help prioritize interventions.

Aim/Goal

Expedite emergent MRIs overnight to enable more rapid medical decision making for patient care. (1) Map the workflow for MRI acquisition to better understand the steps required, (2) gather data on time for each step to identify bottlenecks, and (3) prioritize a practical intervention to reduce delays. (4) Increase radiology resident and MR technologist awareness of each team-members responsibilities and time-limits to improve team dynamics and performance.

The Team



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Special thanks: Donna Hallett and Jillian Augusta for providing MRI data

Progress to Date

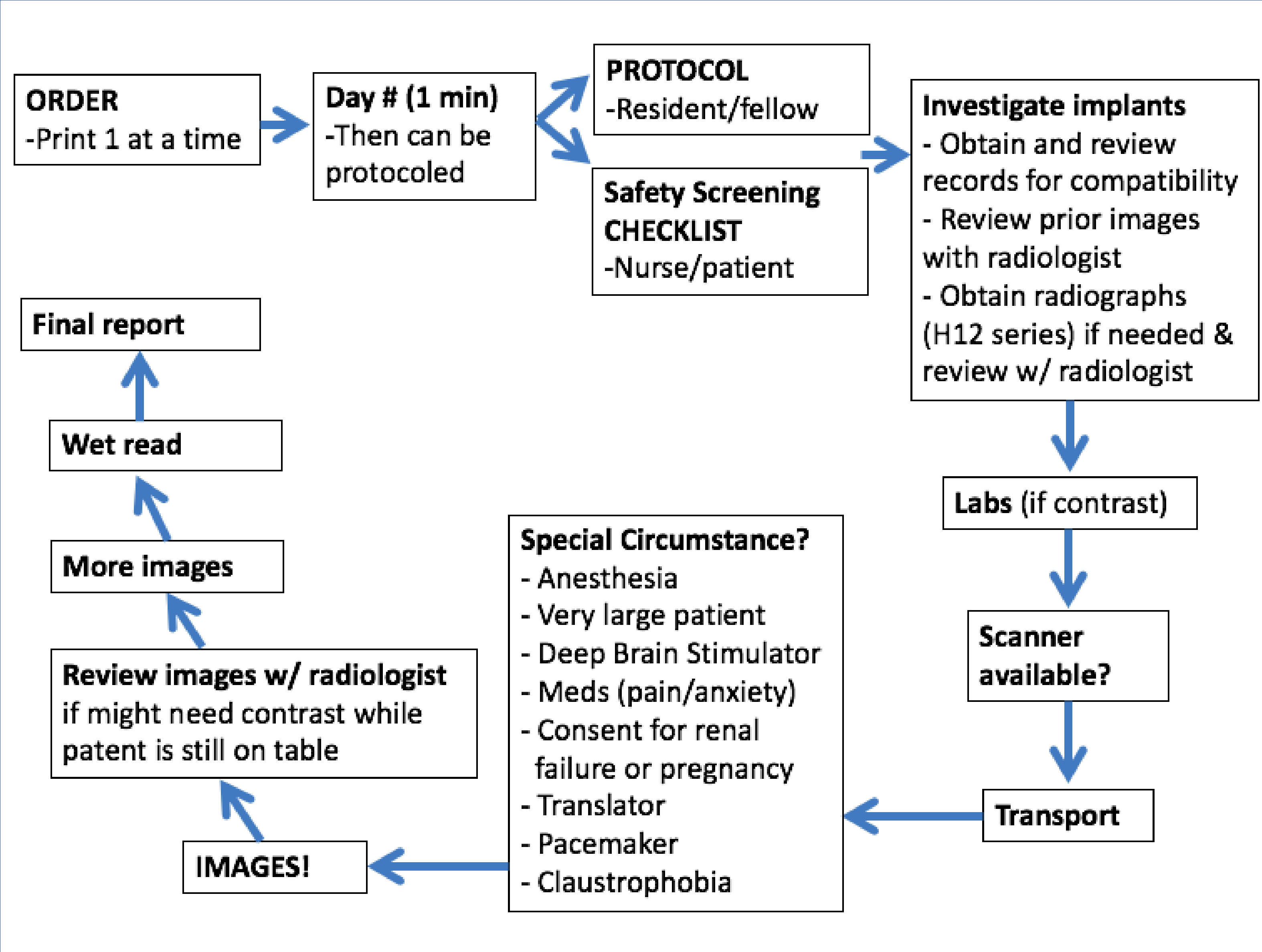
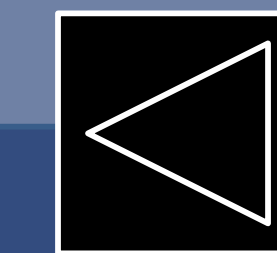


Figure 1: Workflow map for obtaining MRIs overnight

- Areas of potential delays are multiple and variable with areas of concern including the safety checklist, protocol, implant investigation, special circumstances, and scanner availability
- CMS-mandated time-limit from order to image for these studies is **12 hours!**



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MRI timeline: Methods

- MRIs ordered 11pm-7am from 9/17/18-10/17/18 were reviewed (n = 77)
- Neuroradiology MRIs (n = 68) were evaluated separately since they are most frequent and protocolled by radiology residents (Body and MSK MRIs are protocolled by radiology fellows)
- Data recorded: time of order, page, protocol, MR start, MR complete, wet read, final read, and whether the protocol was routine (Y/N)

MRI timeline: Results

- Rarely were time of page or wet read readily available
- 87% (59/68) of overnight neuro MR protocols were considered routine
- Median order to page (n=17) was 20 min (range 3 - 42)
- Median order to protocol (n=66) was 79 min (range 4 - 849)
- Median order to MR initiation (n=60) was 218 min (range 35 - 1419)
- Median order to final read (n=60) was 752 min (range 124 - 5309)

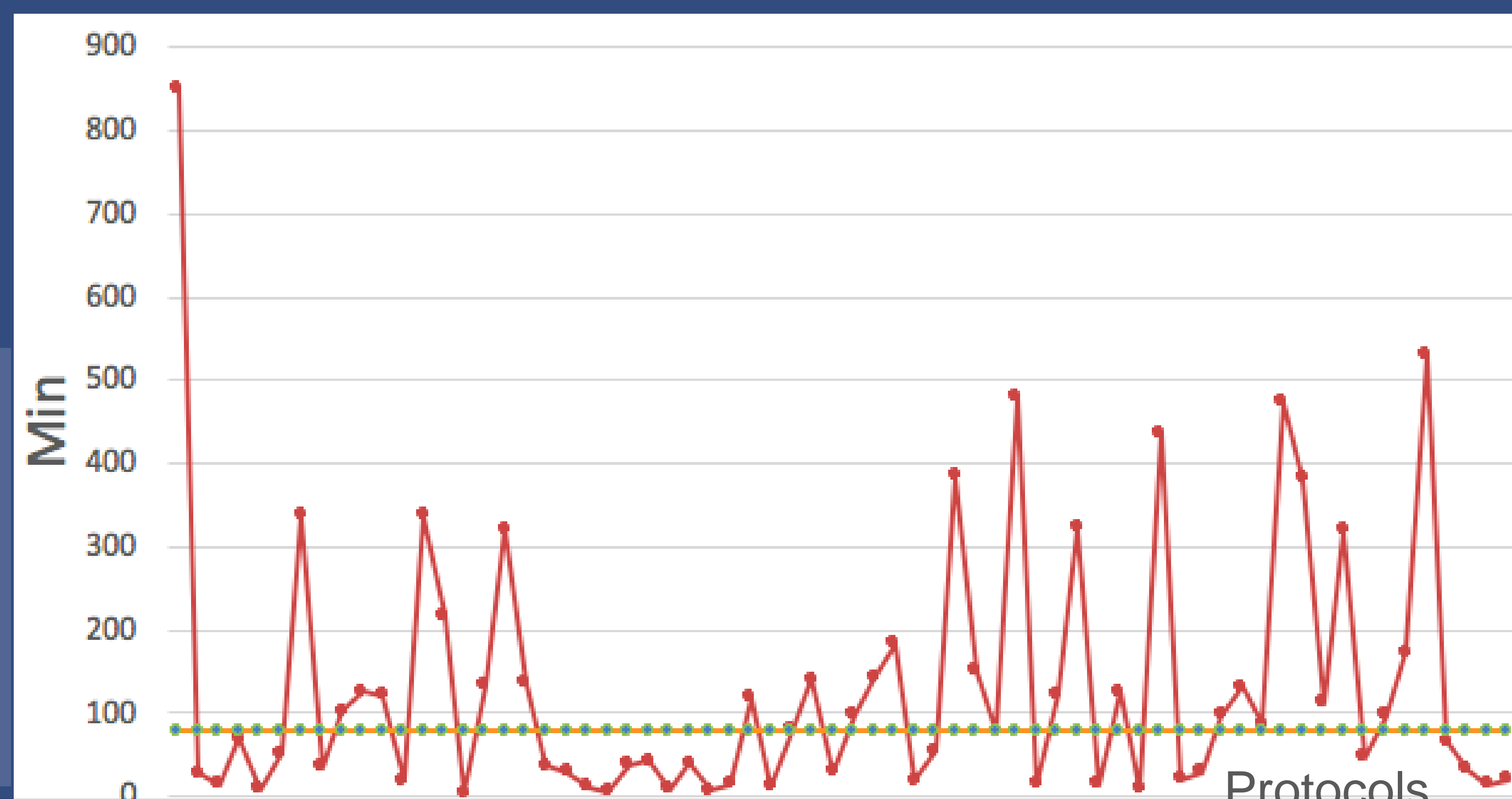


Figure 2:
Run chart of time from order to protocol for neuro radiology MRIs overnight

Lessons Learned

- Overnight MRI workflow has multiple steps potentially causing delays
- Time from order to protocol, to image, and to report are highly variable
- The majority of neuro MRIs ordered overnight are routine protocols
- Awareness of other team member deadlines and responsibilities (MR technologist obtaining MRIs in 12 hours and radiology residents interpreting high acuity studies with demands from multiple sites and services) improved team dynamics

Next Steps

- **Keep learning.** Investigate outliers. Study other steps of the workflow (such as safety checklist and investigating implants). Engage nursing and ED staff to gain added perspective. Establish benchmarks for target times to protocol, checklist, and image acquisition. Calculate impact on daytime schedule, finances, and clinical outcomes if possible.
- **Design intervention.** Based on what we've learned, options include:
 - (1) MRI technologists call overnight radiology resident with anticipated protocol to review and approve over the phone.
 - (2) Standard communication checklist to request protocols including phone call at 30 minutes after initial page to discuss any extenuating circumstances and plan next step as a team.